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SPECIFICATION FOR BRASS SHEET AND STRIP FOR THE MANUFACTURE OF UTENSILS

(Second Revision)

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SPECIFICATION FOR BRASS SHEET AND STRIP FOR THE MANUFACTURE OF UTENSILS

(Second Revision)

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Indian Standard

SPECIFICATION FOR BRASS SHEET AND STRIP FOR THE MANUFACTURE OF UTENSILS

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 18 September 1981, after the draft finalized by the Copper and Copper Alloys Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first published in 1959 and subsequently revised in 1967. In this revision, Grade CuZn 40(B) has been withdrawn and Grade CuZn 40(A) has been retained with some modifications in chemical composition and termed as CuZn40.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements of brass sheet and strip suitable for manufacture of household utensils and brass hollow-ware.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions as given in IS : 3288 (Part I)-1981† shall apply.

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*Rules for rounding off numerical values (*revised*).

†Glossary of terms for copper and copper alloys: Part I Cast form and wrought form (main types) (*second revision*).

2.1 Sheet — Flat product of exact length over 0·15 mm thick and up to and including 10 mm thick and over 300 mm wide. It may be supplied flat or folded or in coiled form.

2.2 Strip — Flat product over 0·15 mm thick and upto and including 10 mm thick, of any width, and generally not cut to length; usually in coil, but may be flat or folded.

3. SUPPLY OF MATERIAL

3.1 General requirements relating to the supply of material shall be as laid down in IS : 1387-1967*.

4. CHEMICAL COMPOSITION

4.1 The material, when analysed in accordance with IS : 3685-1966† shall have the chemical composition as given in Table 1.

TABLE 1 CHEMICAL COMPOSITION (ALLOY DESIGNATION CuZn40)

CONSTITUENT	PERCENT
Copper	58·5 — 61·5
Lead, *Max*	0·05
Tin, *Max*	0·15
Iron, *Max*	0·10
Total impurities (including Iron), *Max*	0·35
Zinc	Remainder

NOTE — Nickel upto 0·7 percent shall be taken as copper.

5. PHYSICAL PROPERTIES

5.1 Hardness — When tested in accordance with IS : 2866-1965‡, the hardness of the material shall not exceed 85 HV.

5.2 Erichsen Cupping Values — The test shall be conducted on the lines of IS : 1756-1974§ and the Erichsen values for the different thicknesses of material shall be as given in Table 2. The dome surface, obtained after the test conducted for Erichsen value shall be smooth.

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*General requirements for the supply of metallurgical materials (*first revision*).

†Methods of chemical analysis of brasses.

‡Methods for Vickers hardness test for copper and copper alloys.

§Method for modified Erichsen cupping test for steel sheet and strip (*first revision*).

TABLE 2 MINIMUM ERICHSEN CUPPING VALUES

(For Annealed Temper Only)

(*Clause* 5.2)

NOMINAL WEIGHT	ERICHSEN VALUE mm
7·5	12·60
8·0	12·70
8·5	12·80
9·0	12·90
9·5	13·00
10·0	13·10
10·5	13·10
11·0	13·10
11·5	13·20
12·0	13·20
12·5	13·30
13·5	13·40
14·0	13·50
15·0	13·50
16·0	13 80
17·0	13·90
18·0	14·00
19·0	14·10
20·0	14·20
21·0	14·30

5.3 Bend Test — Test pieces of the material when subjected to bend test in accordance with IS: 3260-1965* shall withstand the following bend test without showing fracture or development of cracks on the convex surface of the bend.

5.3.1 *Hot Bend Test* — The test piece shall, when at red heat (650°C), be bent through an angle of 180° and hammered close, the axis of the bend being at right angles to the direction of rolling.

5.3.2 *Cold Bend Test* — The test piece shall be bent cold through an angle of 180° with an internal radius equal to the thickness of test piece, the axis of the bend being at right angles to the direction of rolling.

6. FREEDOM FROM DEFECTS

6.1 The sheet and strip in the finished condition shall be clean, smooth, sound and free from surface or visible defects.

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*Method for bend test for copper and copper alloys.

7. DIMENSIONS AND TOLERANCES

7.1 Sizes

7.1.1 *Sheets* — The sheets shall be supplied in the following sizes or as specially required by the purchaser from dimensions specified in IS : 3052-1974*.

1 250 × 1 250 mm, 1 250 × 800 mm, 1 250 × 630 mm and 1 000 × 500 mm

7.1.2 *Strips* — The strips shall be supplied in sizes specified in IS : 3052-1974*.

7.2 Tolerances — The tolerances on different dimensions of sheet and strip shall be in accordance with IS : 3052-1974*.

7.2.1 If material is required on weight basis, the categories shall be as shown in Table 3.

8. SAMPLING AND RETEST

8.1 Sampling — When tests are specifically called for by the purchaser, quantities of sheet (or strip) of the same width, thickness and temper shall be batched together. For each batch the number of samples taken shall be as given below:

> ‘The samples shall be cut off cold and shall receive no further treatment (except that they may be machined to the shape of the test piece) before being tested.’

8.1.1 For batches weighing up to 1 000 kg the number of samples taken shall be in the proportion of one per 200 kg of the material submitted, and fractional remainder being considered as 200 kg. Where strip is supplied in coils weighing more than 200 kg, one sample shall be taken from each coil to provide the necessary test pieces. If the purchaser requires more than one sample to be taken from any coil, the method of taking the additional sample or samples shall be agreed to between the supplier and the purchaser.

8.1.2 Batches exceeding 1 000 kg shall be sub-divided into smaller batches of not less than 200 kg and not more than 1 000 kg to which the provision of **8.1.1** shall then apply.

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*Dimensions for wrought copper and copper alloys, sheet, strip and foil (for general engineering purposes) (*first revision*).

TABLE 3 DIMENSIONS AND WEIGHT CATEGORIES OF BRASS SHEETS

(*Clause* 7.2.1)

THICKNESS (APPROX) (1) mm	CATEGORY (NOMINAL WEIGHT) (2) kg	RANGE OF WEIGHT (3) kg
0·56	7·5	Above 7·25 to 7·75
0·60	8·0	,, 7·75 to 8·25
0·64	8·5	,, 8·25 to 8·75
0·68	9·0	,, 8·75 to 9·25
0·72	9·5	,, 9·25 to 9·75
0·76	10·0	,, 9·75 to 10·25
0·80	10·5	,, 10·25 to 10·75
0·84	11·0	,, 10·75 to 11·25
0·88	11·5	,, 11·25 to 11·75
0·92	12·0	,, 11·75 to 12·25
0·96	12·5	,, 12·25 to 12·75
1·00	13·0	,, 12·75 to 13·25
1·04	13·5	,, 13·25 to 13·75
1·08	14·0	,, 13·75 to 14·25
1·12	14·5	,, 14·25 to 14·75
1·16	15·0	,, 14·50 to 15·50
1·20	16·0	,, 15·50 to 16·50
1·28	17·0	,, 16·50 to 17·50
1·36	18·0	,, 17·50 to 18·50
1·44	19·0	,, 18·50 to 19·50
1·52	20·0	,, 19·50 to 20·50
1·60	21·0	,, 20·50 to 21·50
1·80	23·5	,, 22·50 to 24·50
2·00	26·0	Permissible variation ± 5 percent on nominal weight
2·20	29·0	
2·40	31·5	
2·80	36·5	
3·20	42·0	
3·60	47·0	
4·00	52·5	
4·40	57·5	
4·80	63·0	
5·20	68·0	
5·60	73·5	
6·40	84·0	

NOTE 1 — The weights are based on the assumption that the specific gravity of brass is 8.4.

NOTE 2 — The values given in the category (nominal weight) in the metric system are the weights in kilograms of sheet of the standard metric size, namely 1250 × 1 250 mm rounded off to the nearest 0·5 kg.

8.2 Retests — Should any one of the test pieces first selected by the purchaser or his representative fail to pass any of the prescribed test, two further samples from the same batch shall be selected for testing, one of which shall be from the sheet or strip from which the original test sample was taken, unless that sheet or strip has been withdrawn by the supplier. Should the test piece from both these additional samples pass, the batch represented by the test sample shall be deemed to comply with this standard. Should the test pieces from either of these additional samples fail, the batch represented by the test samples shall be deemed not to comply with this standard. The supplier shall, if required, certify that the sheet and strip complies with the requirements of this standard appropriate to the material ordered.

9. PACKING

9.1 Sheets and strips shall be supplied in bundles weighing approximately 125 or 250 kg and strapped with hoop.

10. MARKING

10.1 Each bundle shall be stencilled on the top and bottom sheet with the grade of the material, the name of the manufacturer, the mass and any other information required by the purchaser.

10.1.1 The material may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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